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EXAMINER

GROSS, CHRISTOPHER M

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SVETLANA V. SHCHEGROVA,
WILLIAM D. FISHER, and PETER G. WEBB

Appeal 2009-003888
Application 10/061,800
Technology Center 1600

Decided:¹ July 22, 2009

Before TONI R. SCHEINER, DEMETRA J. MILLS, and
LORA M. GREEN, *Administrative Patent Judges*.

MILLS, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

STATEMENT OF CASE

This is an appeal under 35 U.S.C. § 134. The Examiner has rejected the claims for lack of written description. We have jurisdiction under 35 U.S.C. § 6(b).

The following claim is representative.

1. A method of fabricating a chemical array using:
 - a head system with multiple groups of drop dispensers;
 - a transport system to move the head system with respect to a substrate;
 - a processor to dispense droplets from dispensers during operation of the transport system in a pattern along a selected path for each group;
 - the method comprising:
 - a) loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with a same fluid;
 - b) dispensing drops from the dispensers to identify an error in one or more dispensers;
 - c) moving a first dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for each group;
 - d) moving a second dispenser of each of the at least one set of redundant dispensers in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser in at least part of the pattern for the selected path of that group, wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path; and
 - e) repeating (a) through (d) at least once;
 - wherein the array is fabricated.

Cited References

Kumar et al. US 6,283,572 B1 Sept. 4, 2001

Gavin MacBeath and Stuart L. Schreiber, *Printing Proteins as Microarrays for High-Throughput Function Determination*, 289 SCIENCE 1760-1763 (2000).

Grounds of Rejection

1. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness.
2. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. § 112, first paragraph, for new matter.
3. Claims 1-33 and 52 stand rejected under 35 U.S.C. § 102(a, e) over Kumar.
4. Claims 1-33 and 49-53 stand rejected under 35 U.S.C. § 103(a) over Kumar in view of MacBeath.

Rejection 1- Indefiniteness

ISSUE

The Examiner argues that independent claim 1 recites the limitation “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path.” The Examiner finds that there are at least three interpretations for this language and that the claim is indefinite for this reason. (Ans. 3.)

Appellants contend that the phrase “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did

not dispense drops in the pattern for the selected path” is not indefinite and the rejection should be reversed. (Reply Br. 4.)

The issue is: Have Appellants shown error in the Examiner’s finding that the claim language “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is indefinite?

FINDINGS OF FACT

1. The Examiner notes that independent claim 1 recites the limitation ““wherein the non-error second dispenser dispenses drop [sic] only where the identified error first dispenser did not dispense drops in the pattern for the selected path’” (Ans. 3).
2. The Examiner notes further that “[o]ther independent claims 6, 25 and 52 state similar language.” “The examiner finds that there are at least three interpretations for this language.” (*Id.*).
3. The Examiner finds that:

[T]his language could be construed to mean that the non-error second dispenser does not dispense any drops at all, except “only where” the identified error first dispenser should have, but did not, dispense drops in the said selected path. In other words, the first and second dispensers of a set can only deposit drops in the same locations. If a first dispenser of a set is found to be in error, a non-error second dispenser of the same set, can only dispense where first dispenser failed to cover, and not in a separate location or pattern.

(*Id.* at 3-4.)

4. “The examiner submits that this construction seems to be consistent, e.g., with appellant's traversal of the anticipatory rejection, in the Reply at p. 14/18, stating:

‘Specifically, the ‘non-error’ dispensers of Kumar et al. deposit drops in location other than where an error dispenser in the same set did not deposit a drop.’”

(Ans. 4.)

5. The Examiner finds that, secondly,

[T]his language could be construed to mean that non-error second dispenser dispenses drops only in those locations on the substrate in the selected path of, e.g., a first group, (of which the identified error first dispense is a member), only *where* the identified error first dispenser did not dispense drops in the pattern for said selected path of the first group. The examiner respectfully notes that this limitation encompasses the dispensing of drops, by the non-error second dispenser, that avoid any droplets resulting from a “soft nozzle failure” that resulted in a solution break up into multiple smaller drop during firing of the identified error first dispenser, (see, invention Disclosure reproduced in the Appendix of the Declaration by all of the instant inventors, entered 3/25/2005, at p. 31, first paragraph [entitled “Problem”]).

(*Id.*)

6. The Specification, page 16, defines “error” as, “any discrepancy between a nominal dispenser parameter and an actual parameter, such as deviations in size (including absence), location, or shape, of a deposited drop may only be classified as an ‘error’ if it meets or exceeds a predetermined threshold value.”

7. A “hard error” is used by Appellants to describe a dispenser which does not fire. (App. Br. 8.)

8. A “soft error” is used by Appellants to describe a dispenser which releases some solution drops, but not all required solution drops. (*Id.*)

PRINCIPLES OF LAW

“The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification.” *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993). Claims are in compliance with 35 U.S.C. § 112, second paragraph, if “the claims, read in light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits.” *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385 (Fed. Cir. 1986). “The standard of indefiniteness is somewhat high; a claim is not indefinite merely because its scope is not ascertainable from the face of the claims.” *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1342 (Fed. Cir. 2003). Rather, “[a] claim is indefinite if, when read in light of the specification, it does not reasonably apprise those skilled in the art of the scope of the invention.” *Id.*

Importantly claim “breadth is not to be equated with indefiniteness.” *In re Miller*, 441 F.2d 689, 693 (CCPA 1971); *see also In re Hyatt*, 708 F.2d 712, 714-15 (Fed. Cir. 1983).

ANALYSIS

“Since the claims are not separately argued, they all stand or fall together.” *In re Kaslow*, 707 F.2d 1366, 1376 (Fed. Cir. 1983).

Appellants argue that

[T]he dispensing operation of independent claims 1, 6, 25, and 52 all include the following:

1. identifying error-dispensers (either “hard” or “soft” error dispensers);
2. depositing drops from non-error dispensers in the selected pattern; and
3. moving a second, redundant dispenser along the selected path while dispensing drops from a non-error second dispenser only where the identified error first dispenser did not dispense drops in the pattern for the selected path.

(App Br. 8.)

Appellants argue that

[I]dentified error-dispensers in the claimed invention are actively excluded from dispensing drops anywhere in the selected pattern (i.e., only non-error dispensers are used for this purpose). Therefore, it does not matter whether an error dispenser is a “hard” or “soft” error dispenser because, regardless of the reason a dispenser is identified as an error dispenser, it is simply not used in the dispensing steps. In other words, the error dispensers do not dispense at all (consistent with the first interpretation of the Examiner above).

(*Id.*) Appellants argue that, in view of this, one of skill in the art would be reasonably apprised of the scope of the claim and that the claims are clear and definite. (App. Br. 9.)

The Examiner appears to argue that the claims are broad, encompassing several embodiments, and encompass both corrections of “hard” and “soft” dispenser errors. (FF 3 and 5.) However, claim “breadth is not to be equated with indefiniteness.” *In re Miller*, 441 F.2d 689, 693 (CCPA 1971); *see also In re Hyatt*, 708 F.2d 712, 714-15 (Fed. Cir. 1983).

The fact that the claims may encompass several embodiments in the present case, does not render the claims indefinite. We agree with Appellants that the claims, when read in light of the Specification (FF6), reasonably apprise those skilled in the art of the scope of the invention. The indefiniteness rejection is reversed.

CONCLUSION OF LAW

Appellants have shown the Examiner erred in finding that the claim language “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is indefinite.

Rejection 2 - New Matter

ISSUE

The Examiner finds that

Independent claim 1 has been amended to state the limitation “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” . . .

The examiner respectfully notes that the specification, at p. 13, lines 30-31, states that “[o]nly one non-error dispenser in each set is needed during array fabrication.”

(Ans. 6.)

According to the Examiner,

The claims now encompass methods wherein non-error second dispenser dispenses drops only in those locations on the substrate in the selected path of, e.g., a first group, (of which the identified error first dispense is a member), only where the identified error first dispenser did not dispense drops in the

pattern for said selected path of the first group. The examiner respectfully notes that this limitation encompasses the dispensing of droplets, by the non-error second dispenser, that avoid any droplets resulting from a “soft nozzle failure” that resulted in a solution break up into multiple smaller drops during firing of the identified error first dispenser, (see, Invention Disclosure reproduced in the Appendix of the Declaration by all of the instant inventors, entered 3/25/2005, at p. 31, first paragraph [entitled “Problem”]).

(Ans. 6.)

Thus, the Examiner finds that the Specification “does not describe methods wherein a non-error second dispenser dispenses only to those areas around imperfect deposition of droplets resulting from soft nozzle failures.” *Id.* For this reason, the Examiner finds that one of skill in the art would not envision that Appellants had possession of the full scope of the claimed invention. *Id.*

Appellants argue “that the claims and the specification clearly describe not using identified error dispensers to dispense drops when fabricating a chemical array.” (Reply Br. 4.)

The issue is: Have Appellants shown the Examiner erred in finding that the claim language “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is new matter.

ANALYSIS

“Since the claims are not separately argued, they all stand or fall together.” 37 C.F.R. § 41.37(c)(1)(vii).

The Specification, page 16 defines an “error” as “any discrepancy between a nominal dispenser parameter and an actual parameter, such as deviations in size (including absence), location, or shape, of a deposited drop may only be classified as an ‘error’ if it meets or exceeds a predetermined threshold value.” (FF6.) This definition of “error” would reasonably appear to include both soft and hard dispenser errors, as deviations in deposited drop size, including the absence of drops, are considered to be associated with error dispensers. Thus, we find that the Specification (FF6) supports claim 1, which encompasses both soft and hard dispenser errors, and thus claim 1 does not include new matter.

CONCLUSION OF LAW

Appellants have shown that the Examiner erred in finding that the claim language “wherein the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” is new matter.

We find that the Specification as filed supports the pending claim scope, and the rejection of the claims for new matter is reversed.

Rejection 3 - Anticipation

Claims 1-33 and 52 are rejected under 35 U.S.C. § 102(a, e) as being anticipated by Kumar. 37 C.F.R. § 41.37(c)(1)(vii).

Issue for Rejections 3 and 4

The Examiner argues that “Kumar et al., at Tables I and II teach deposition by redundant dispensers (nozzles 2, 50 and 98 of Table II) that

dispense only where (i.e., Row 2) the defective dispenser (nozzle 146) should have, but did not.” (Ans. 9.)

Appellants argue that “the “non-error” dispensers of Kumar et al. are not employed as is claimed in the subject application.” (App. Br. 11.) Specifically, Appellants argue that the “non-error” dispensers of Kumar deposit drops in locations other than where an identified error dispenser did not deposit a drop, in contrast to the claims of the subject application. (App. Br. 11.)

The Issue is: Have Appellants shown that the Examiner erred in interpreting that the “non-error” dispensers of Kumar read on the pending claims, even if they deposit drops in location other than where an error dispenser in the same set did not deposit a drop?

FINDINGS OF FACT

9. The Examiner finds that

The claims of the invention set forth methods that utilize a set of non-error redundant dispensers to correct identified error dispensers. The methods claimed generally comprise the steps of loading each set of redundant dispensers with the same fluid; dispensing drops from the dispensers to identify an error; moving first dispensers or a frame of first dispensers along a selected path while dispensing only from non-error dispensers, and moving a redundant dispenser or frame with redundant dispensers along the selected path while dispensing drops from non-error redundant dispensers in the same set as the error first dispensers.

(Ans. 8.)

10. “Kumar . . . col. 1, lines 43-50, teach that an inkjet printer prints ink dots at particular locations of an array, thereby reading on fabricating a chemical array.” (*Id.*)

11. “Kumar et al., at col. 7, line 23-col. 8, line 56, Figure 7, Tables I and II, disclose methods comprising redundant nozzles, wherein each nozzle is tested (col. 6, line 15-col. 7, line 8); and wherein malfunctioning dispensers are replaced by redundant dispensers. Kumar et al., col. 1, line 61-col. 2, line 10, teaches pulse inkjet dispensers.” (*Id.*)

12. The Examiner finds that in Kumar, Table II, identified error dispense[r] 146 is not used at all and did not dispense any drops. Non-error dispenser 50 dispenses ... where the identified error dispenser 146 did not dispense any drops. (Ans. 16-17.)

13. The Specification, page 12, ll. 25-27, states that “[d]ispensers within a set are therefore redundant in that one can be used in place of the other during the array fabrication (assuming the one used in place is functioning and is not in error in some way).”

14. The Specification states that

A “set” or “sub-set” of any item (such as a set of dispensers) may contain only one of the item, or only two, or three, or any number of multiple items. An “array”, unless a contrary intention appears, includes any one, two or three dimensional arrangement of addressable regions bearing a particular chemical moiety to moieties (for example, biopolymers such as polynucleotide sequences) associated with that region.

(Spec. 8, ll. 28 – 31 to 9, l. 1.)

15. The Specification states that

An array is “addressable” in that it has multiple regions of different moieties (for example, different polynucleotide sequences) such that a region (a “feature” or “spot” of the array) at a particular predetermined location (an “address”) on the array will detect a particular target or class of targets (although a feature may incidentally detect non-targets of that feature).

(Spec. 9, ll. 1-5.)

16. Claim 1 recites that “the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path.”

PRINCIPLES OF LAW

Our mandate is to give claims their broadest reasonable interpretation. *In re American Academy Of Science Tech Center*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). During ex parte prosecution, claims are to be given their broadest reasonable interpretation consistent with the description of the invention in the specification. *See In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989).

To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001).

“The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art.” *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991). “Non-obviousness cannot be established by attacking references individually where the rejection is based

upon the teachings of a combination of references. . . . [The reference] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.” *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

ANALYSIS

With respect to the anticipation rejection, Appellants argue that Kumar, Table II discloses that “non-error” dispensers deposit drops at locations other than where identified error dispensers did not deposit a drop. (App. Br. 11.) Appellants argue that Kumar does not disclose first and second redundant dispensers. (App. Br. 14.) Appellants argue that even if Kumar dispenser 50 is taken to be a non-error second dispenser, it dispenses drops in locations in addition to where an identified error dispenser did not deposit a drop. For example, dispenser 50 dispenses at its own “normal locations” (i.e., in columns 1, 5, 9, during Pass 2). (App. Br. 14.)

The Examiner submits that the claim limitation reciting that the “second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path” encompasses an embodiment where the “non-error” dispensers dispense drops both at locations where identified error dispensers did not (i.e., where “error” dispenser 146 did not) and where the nonerror dispensers dispense at locations other than where identified error dispensers did not, as taught by Kumar. (*See* col. 8, ll. 25-30.) (Ans. 10.)

We agree with the Examiner that the claims do not exclude an embodiment wherein a redundant dispenser also deposits at locations other than where identified error dispensers did not. According to the

Specification, a “set” or “sub-set” of any item (such as a set of dispensers) may contain only one of the item. In Kumar, dispenser 50, a single dispenser is redundant to error dispenser 146.

As to the claim limitation that “the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops in the pattern for the selected path,” we interpret this phrase broadly. In the context of the specification as a whole, we find this phrase to mean that the second (redundant) dispenser deposits drops to correct an error in the first dispenser only where the first dispenser did not dispense drops. Upon careful review of the Specification, we find no specific prohibitive recitation that the redundant, non-error dispenser may not deposit drops at other error or non-error locations. Appellant has not pointed to a specific location in the Specification which would prohibit such a broad claim interpretation.

Thus we find that Kumar discloses each element claimed. In view of the above, the anticipation rejection is affirmed.

Rejection 4- Obviousness

Claims 1-33 and 49-53 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kumar in view of MacBeath. “Since the claims are not separately argued, they all stand or fall together.” 37 C.F.R. § 41.37(c)(1)(vii).

FINDINGS OF FACT

17. According to the Examiner “Kumar et al., does not disclose methods comprising fabricating an array that is a biopolymeric array, in claims 49-51 and 53.” (Ans. 11.)

18. MacBeath “throughout the publication, and at p. 1760, right-hand column, teach using contact printing to fabricate protein arrays.” (*Id.*)

19. According to the Examiner, “It would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made to combine methods comprising dispenser technology include the step of identifying an error dispenser as taught by Kumar et al. in the method of MacBeath et al., biopolymeric arrays are fabricated.” (*Id.*)

20. According to the Examiner, “One of ordinary skill in the art would have been motivated use printing methods to fabricate biopolymer arrays because MacBeath, in the abstract, teach the use of such methods to permit high-throughput assays of thousands of proteins.” (*Id.*)

21. According to the Examiner, it would have been reasonable for one of ordinary skill in the art to look to the field of printer technology at the time of invention given that microarray production companies were innovating with concepts borrowed from printer technology. (*Id.*)

ANALYSIS

Appellants argue that to modify the teachings of Kumar to comport with the limitation of fabricating an array that is a biopolymeric array would render the invention of Kumar unsuitable for its intended purpose because “[f]ailure to deposit at such normal locations [in Kumar] would result in a printed product that is missing deposited drops where drops should be:

precisely the opposite result that Kumar is trying to achieve” (App. Br. 14). Appellants submit that Kumar fails to at least teach the claim limitation that “the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops.” Since MacBeath is cited merely for its teaching of biopolymeric arrays, it fails to remedy the deficiency of Kumar. Appellant argues that Kumar dispenser 50 dispenses in locations other than where an identified error dispenser did not deposit a drop. This is different from what is recited in the rejected claims, where “non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops.” (Reply Br. 6.)

The Examiner, in response to Appellant's arguments, argues that Kumar teaches a method of controlling error in array fabrication. Using the method of Kumar to print a biopolymeric array would not result in a printed product that is missing deposited drops where drops should be.

(Ans. 13-14.)

We agree with the Examiner that Appellant cannot show nonobviousness by attacking references such as Kumar, individually, where the rejections are based on the combination of references including MacBeath. The Examiner finds that Appellants’ arguments are directed at Kumar and not the combination of the references of Kumar and MacBeath.”

(Ans. 13.)

Nor are we persuaded that Kumar fails to at least teach the claim limitation that “the non-error second dispenser dispenses drops only where the identified error first dispenser did not dispense drops.” For the reasons given with respect to the claim interpretation made in the anticipation

rejection herein, we find that Kumar discloses a method as claimed, and that MacBeath applies such a method to a biopolymeric array.

CONCLUSION OF LAW

Appellants have not shown that the Examiner erred in interpreting the “non-error” dispensers of Kumar read on the pending claims even if they deposit drops in location other than where an error dispenser in the same set did not deposit a drop. The combination of references renders the claimed subject matter obvious. The obviousness rejection is affirmed.

SUMMARY

The indefiniteness and written description (new matter) rejections are reversed. The anticipation and obviousness rejections are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

cdc

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